Neponset River
Dredge Spoils Assessment
RESULTS
Boston and Milton

Executive Office of Energy and Environmental Affairs (EOEEA)
Department of Environmental Protection (MassDEP)
Department of Conservation and Recreation (DCR)

Prepared by MassDEP, DCR & MACTEC Engineering & Consulting, Inc.
Contractor to MassDEP

Overview of Presentation

- Background
- Purpose and Objectives
- Sampling and Analysis
- Data Evaluation and Conclusions
- Path Forward

What are Polychlorinated Biphenyls (PCBs)?

- Chemicals used widely as cooling, insulating and di-electric fluids, especially in transformers.
- Manufactured by Monsanto from 1930s to 1970s.
- Persistent in nature and not very soluble in water.
- Accumulate in sediments and can accumulate in animal and plant life.
- PCBs are found widely in sediments.
- They are associated with cancer and non-cancer health effects in animals and people.

ATSDR fact sheet

Neponset River Dredge History

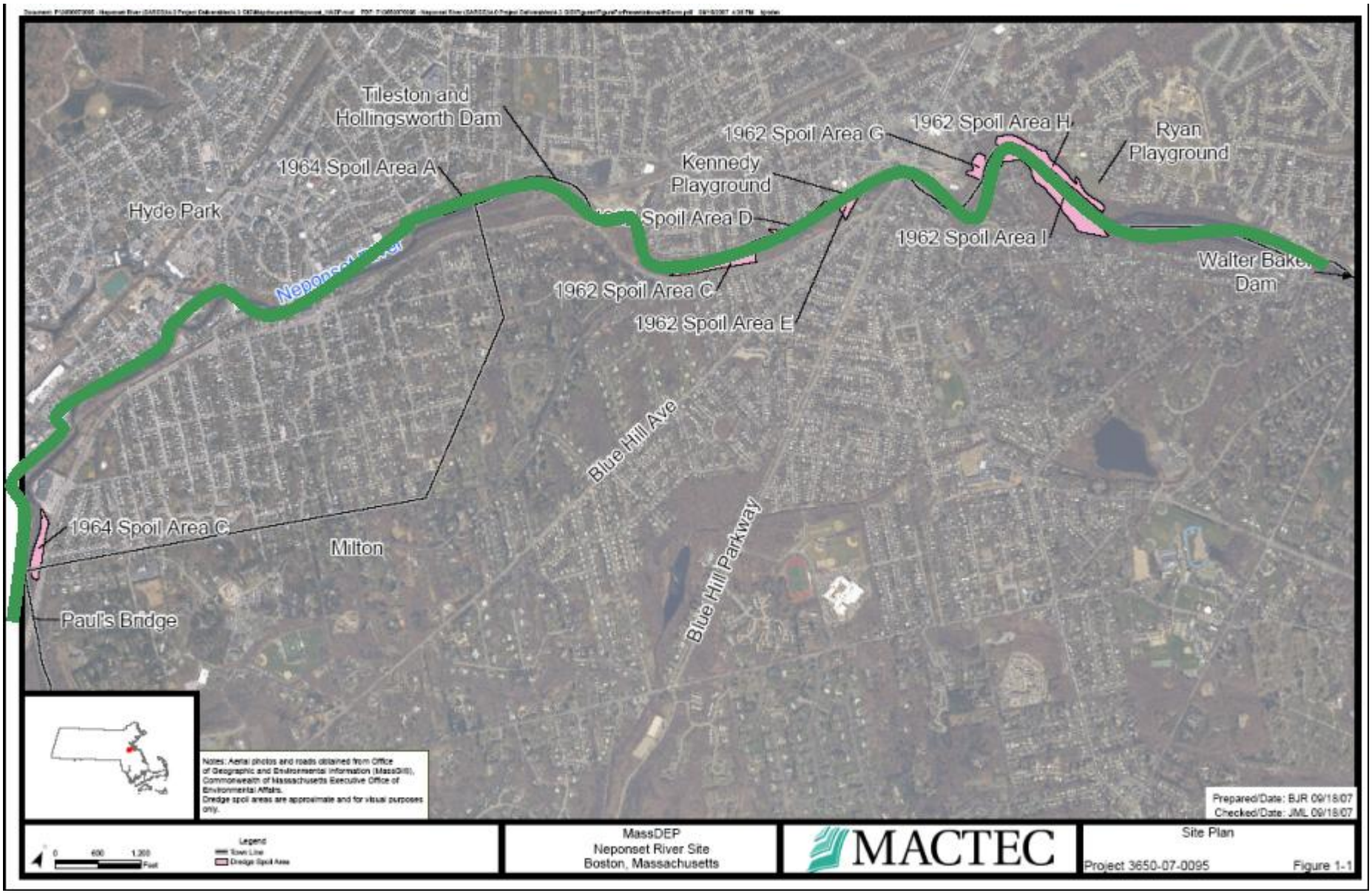
- 1955 flooding of Neponset River and across southern New England
- In 1962 and 1964, MDC performed repair work and flood control, including dredging:
  - 1962: Walter Baker Dam to Tileston-Hollingsworth Dam
  - 1964: Tileston Hollingsworth Dam to Paul's Bridge
- USGS sediment study found elevated PCB concentrations in Neponset River sediment
- Concern over potential for dredge spoils to be impacted with PCBs
- Concern for public health

Dredging Barge on Neponset River

Purpose of Project

- Historical dredge spoils had been placed in areas along the Neponset River that are currently accessible to and used by the public
- Some recent studies of the Neponset River suggested that the dredge spoils might contain PCBs and possibly metals at levels of concern
- These areas were investigated to determine if they are safe for recreational use

STUDY AREA


Tileston and Hollingsworth Dam
1964 Spoil Area A
Hyde Park
1962 Spoil Area G
1962 Spoil Area H
Kennedy Playground
Ryan Playground
Spoil Area D
1962 Spoil Area I
Walter Baker Dam
1962 Spoil Area C
1962 Spoil Area E
Blue Hill Ave
1964 Spoil Area C
Milton
Blue Hill Parkway
Paul's Bridge
Notes: Aerial photos and roads obtained from Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs.
Dredge spoil areas are approximate and for visual purposes only.
Prepared/Date: BJR 09/18/07
Checked/Date: JML 09/18/07
Legend
Town Line
Dredge Spoil Area
MassDEP
Neponset River Site
Boston, Massachusetts
MACTEC
Site Plan
Project 3650-07-0095
Figure 1-1

Purpose of Sampling

- Assess locations that are used frequently and have received dredge spoils.
- Determine if PCBs and metals are present at levels of concern in soil that people could come in contact with.
- Determine if more sampling is needed to fully define an area of concern or whether there is no need for concern.
- Determine if actions are necessary to address short term risk or long-term risk (if any) - eliminate access to and prevent direct contact with any soil that presents a public health risk.

Exposure Discussion

- Contact with soil or sediment containing PCBs at elevated levels is required to put one at risk.
- Generally the top foot of soils or sediment is thought to be “readily accessible”.
- Potential Exposure Pathways:
  - Skin contact with soil and absorption through skin,
  - Incidental ingestion of soil (hand-to-mouth activity),
  - Inhalation of dust (typically negligible unless soil is significantly disturbed).

Exposure Discussion

- MassDEP has identified levels of concern for PCBs and metals in soil in the “Massachusetts Contingency Plan” (the MCP).
- Soil levels above MCP standards may pose a health risk.
- MCP looks at life time exposure and short term exposure.
- If there is a short term risk, access and exposure to soils should be prevented or eliminated.

MCP Soil Standards

Chemicals in soil at levels greater than or equal to the following could pose a potential health risk over a lifetime:

PCBs: 2 parts per million (ppm)

Total Arsenic: 20 ppm

Total Lead: 300 ppm

Total Nickel: 20 ppm

Prevent direct contact with chemicals in soil at levels greater than or equal to the following:

PCBs: 10 ppm

Total Arsenic: 40 ppm

Completed Assessment Work

- Surface soil and sediment sampling December 2007 & January 2008
- 80 surface soil sample locations (160 samples) and 4 sediment samples at canoe launches
- Sampling completed in the most publicly accessible areas:
  - Trails
  - Playgrounds, Baseball outfield
  - Vegetable gardens (Raised Bed)
  - Canoe launches

- Sampling at privately owned properties to be conducted in future

Additional Metals Analysis

- Based on review of initial metals results, more of the collected samples were analyzed for metals
  - Delineate further
  - Allow calculation of representative concentrations for the areas (average (AVG))
- 39 samples analyzed in this effort (total of 67 soil samples analyzed for metals)

Status of Sampling Program

Dredge Year	*Dredge Spoil Area*	*Description and Nearest Receptor*	*Sampling Status*
1962	Spoil Area “C”	Residential Area near Truman Highway, Milton	Completed
	Spoil Area “D”	Kennedy Playground and Walking Trail, Residential Area near Edgewater Drive, Boston	Completed
	Spoil Area “E”	DCR building on Truman Highway, Milton	Phase 1 completed, Phase 2 planned with soil removal
	Spoil Area “G”	Public access/path near Riverside Place, Boston	Completed
	Spoil Area “H”	Ryan Playground (DCR) near River Street, Boston	Completed
	Spoil Area “I”	Residential Area near Eliot Street, Boston	Phase 1 completed, Phase 2 sampling planned
1964	Spoil Area “A”	Business/Residential Area near Railroad Avenue/Riverside Square, Boston	To be scheduled
	Spoil Area “C”	Business area (Stop & Shop) near Truman Highway, Milton	To be scheduled

Sampling and Analysis

- Samples collected with hand tools for PCBs analysis
- Quality control and assurance measures incorporated in sampling
- Equipment decontamination tested and no evidence of residual equipment contamination and cross-contamination found
- All soil and sediment samples analyzed for PCBs
- 67 soil samples and all 4 sediment samples analyzed for EPA Priority Pollutant Metals analysis (13 metals)

Analytical Details

- PP-13 Metals (EPA 6010B (ICP), EPA 7470/7471, EPA 7000)

  - Beryllium
  - Cadmium
  - Chromium
  - Copper
  - Nickel
  - Silver
  - Zinc
  - Arsenic
  - Mercury
  - Antimony
  - Selenium
  - Lead
  - Thallium

- PCBs (EPA 8082 (GC))

  - Aroclor 1016
  - Aroclor 1221
  - Aroclor 1232
  - Aroclor 1242
  - Aroclor 1248
  - Aroclor 1254
  - Aroclor 1260
  - Aroclor 1262
  - Aroclor 1268

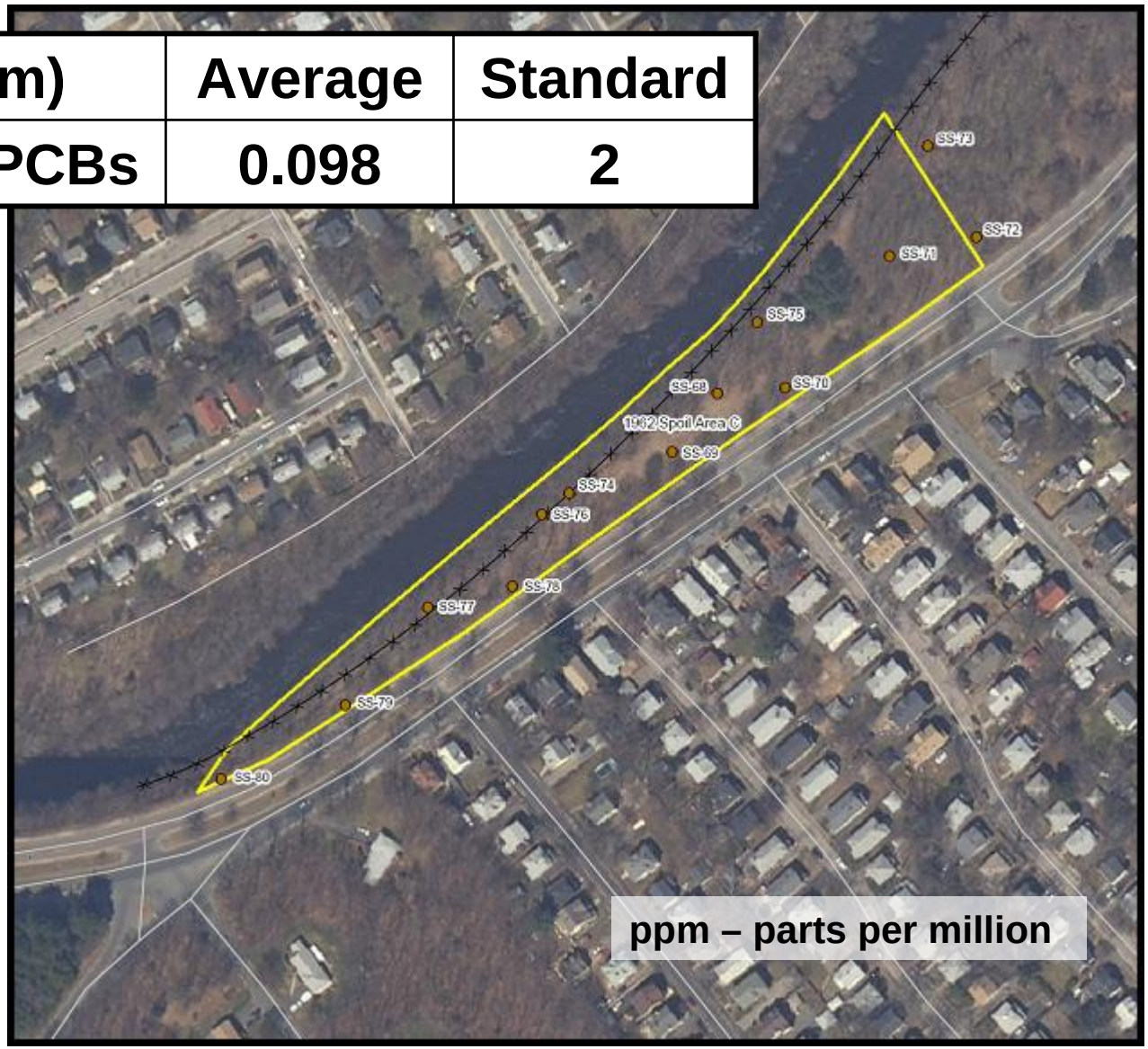
Nomen

Soil Sampling

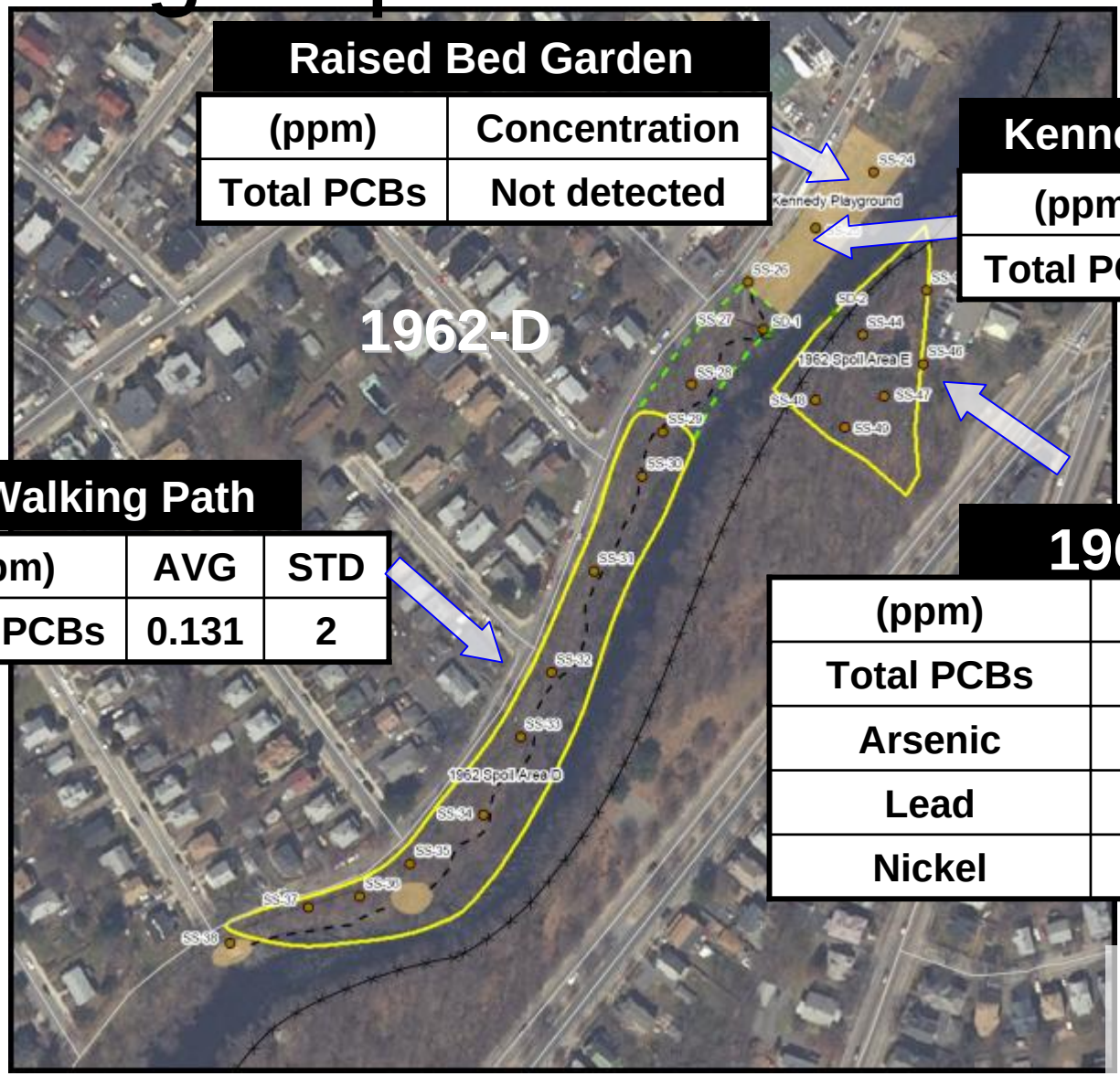
Sediment Sampling

Dredge Spoil 1962-C

(ppm)	Average	Standard
Total PCBs	0.098	2



Dredge Spoil 1962-D & 1962-E



Raised Bed Garden

(ppm)	Concentration
Total PCBs	Not detected

Kennedy Playground

(ppm)	AVG	STD
Total PCBs	0.016	2

Walking Path

(ppm)	AVG	STD
Total PCBs	0.131	2

1962-E

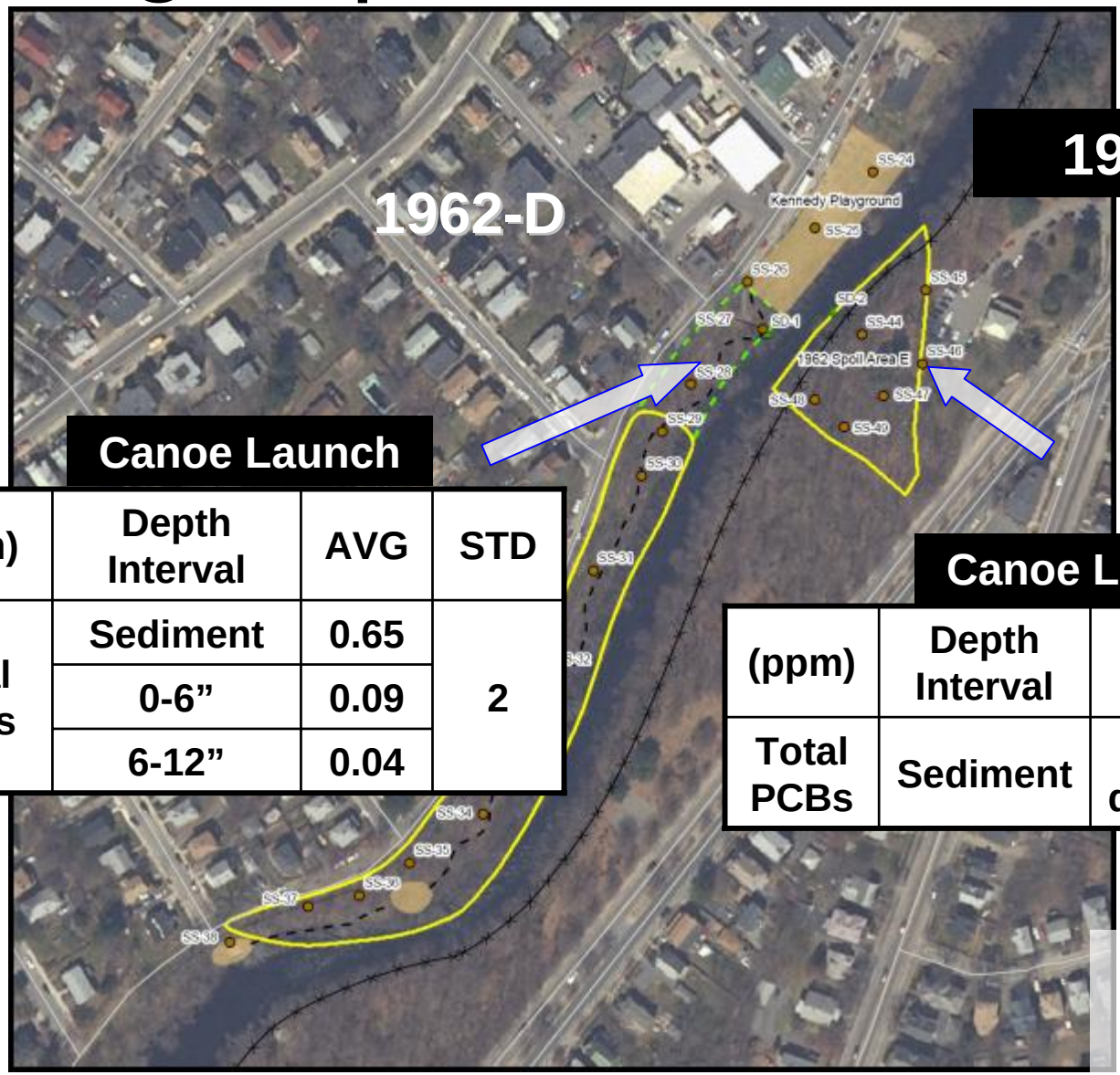
(ppm)	AVG	STD
Total PCBs	0.212	2
Arsenic	8.0	20
Lead	539	300
Nickel	9.5	20

AVG – Average

STD – Standard

ppm – parts per million

Dredge Spoil 1962-D & 1962-E



Canoe Launch

(ppm)	Depth Interval	AVG	STD
Total PCBs	Sediment	0.65	2
	0-6”	0.09	
	6-12”	0.04	

Canoe Launch

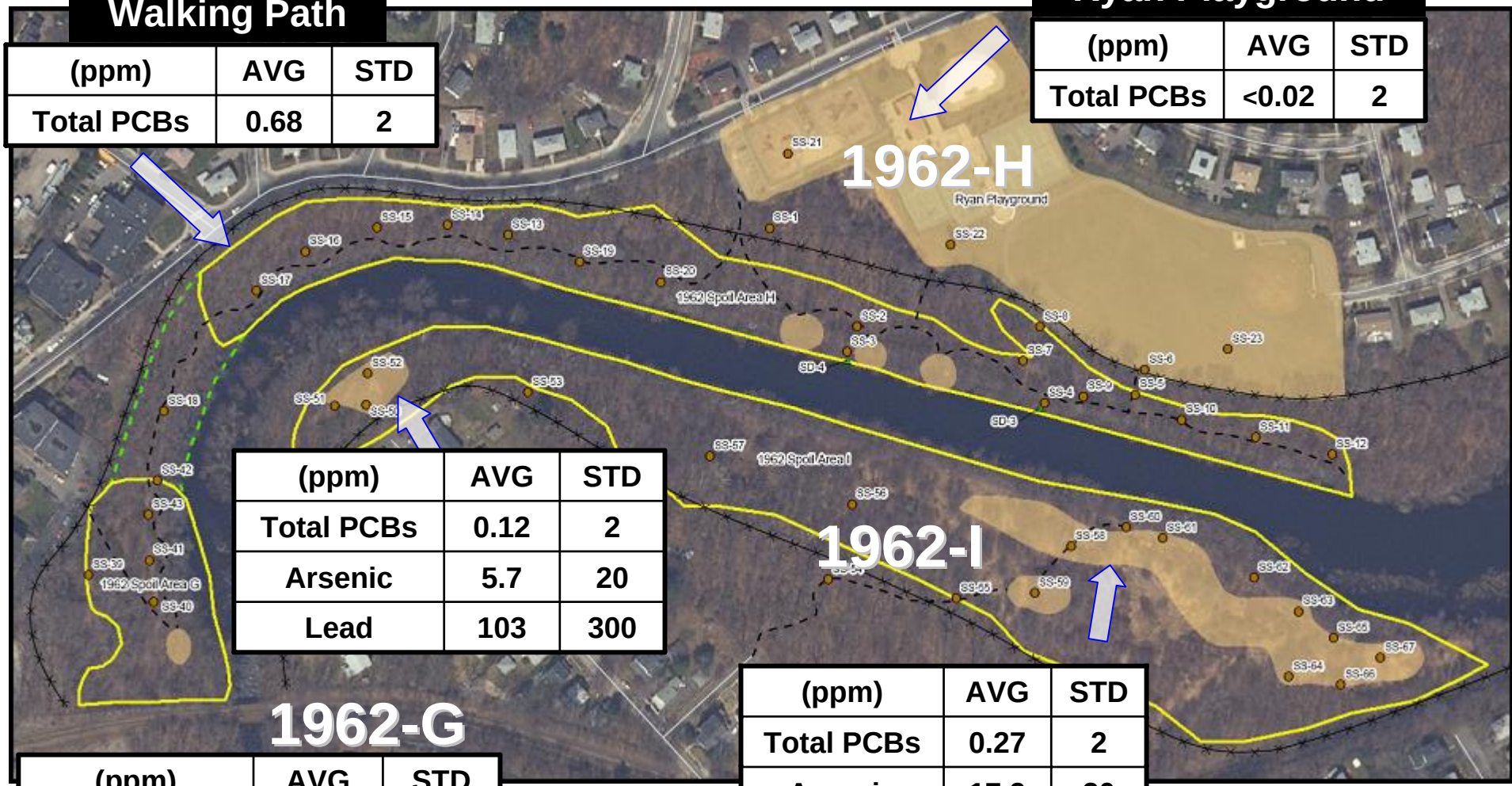
(ppm)	Depth Interval	AVG	STD
Total PCBs	Sediment	Not detected	2

AVG – Average

STD – Standard

ppm – parts per million

Dredge Spoil 1962-G, 1962- H & 1962-I



Walking Path

(ppm)	AVG	STD
Total PCBs	0.68	2

Ryan Playground

(ppm)	AVG	STD
Total PCBs	<0.02	2

(ppm)	AVG	STD
Total PCBs	0.12	2
Arsenic	5.7	20
Lead	103	300

(ppm)	AVG	STD
Total PCBs	0.27	2
Arsenic	17.9	20
Lead	187	300

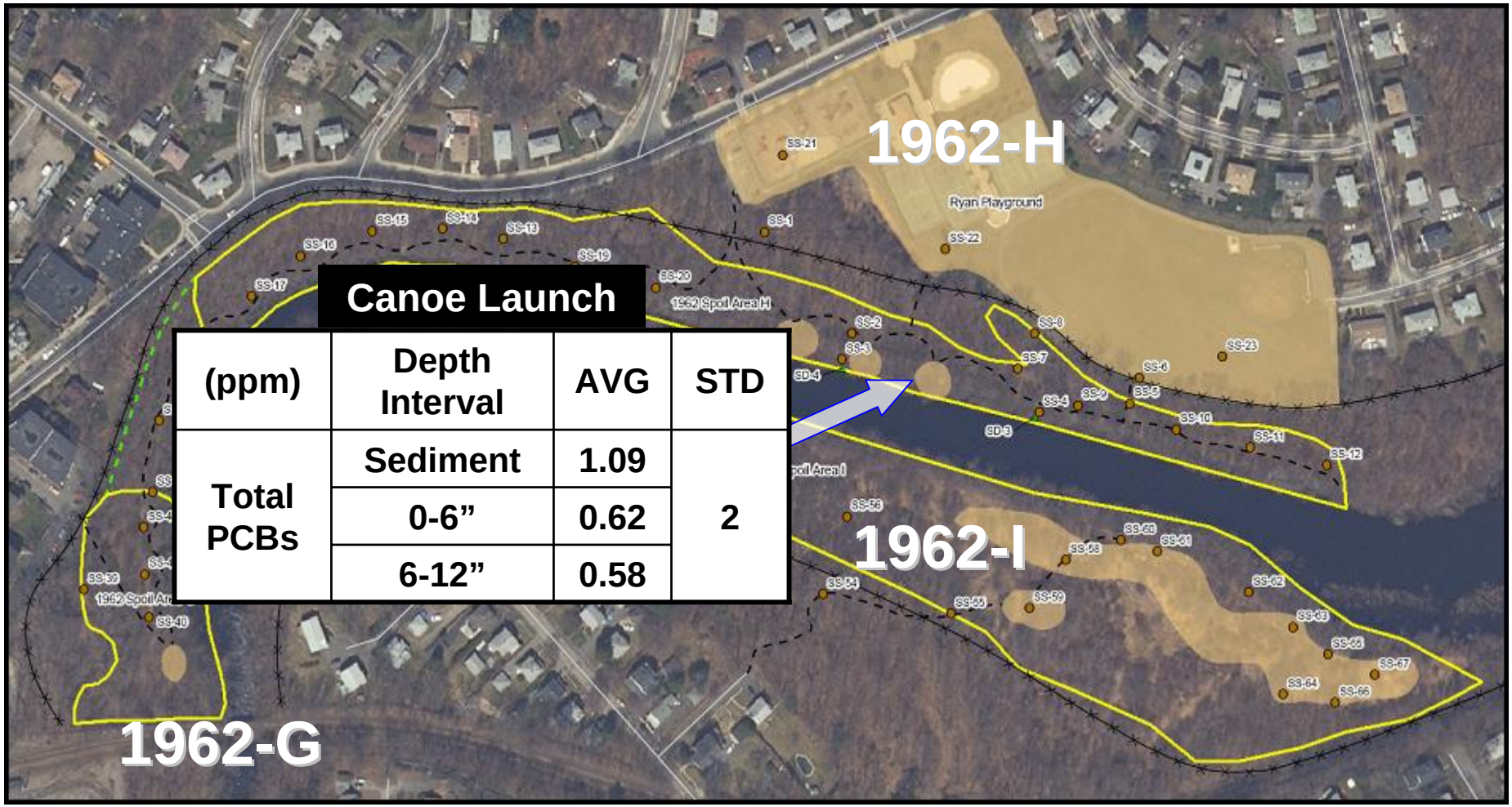
(ppm)	AVG	STD
Total PCBs	0.745	2

AVG – Average

STD – Standard

ppm – parts per million

Dredge Spoil 1962-G, 1962- H & 1962-I



(ppm)	Depth Interval	AVG	STD
Total PCBs	Sediment	1.09	2
	0-6”	0.62	
	6-12”	0.58	

AVG – Average

STD – Standard

ppm – parts per million

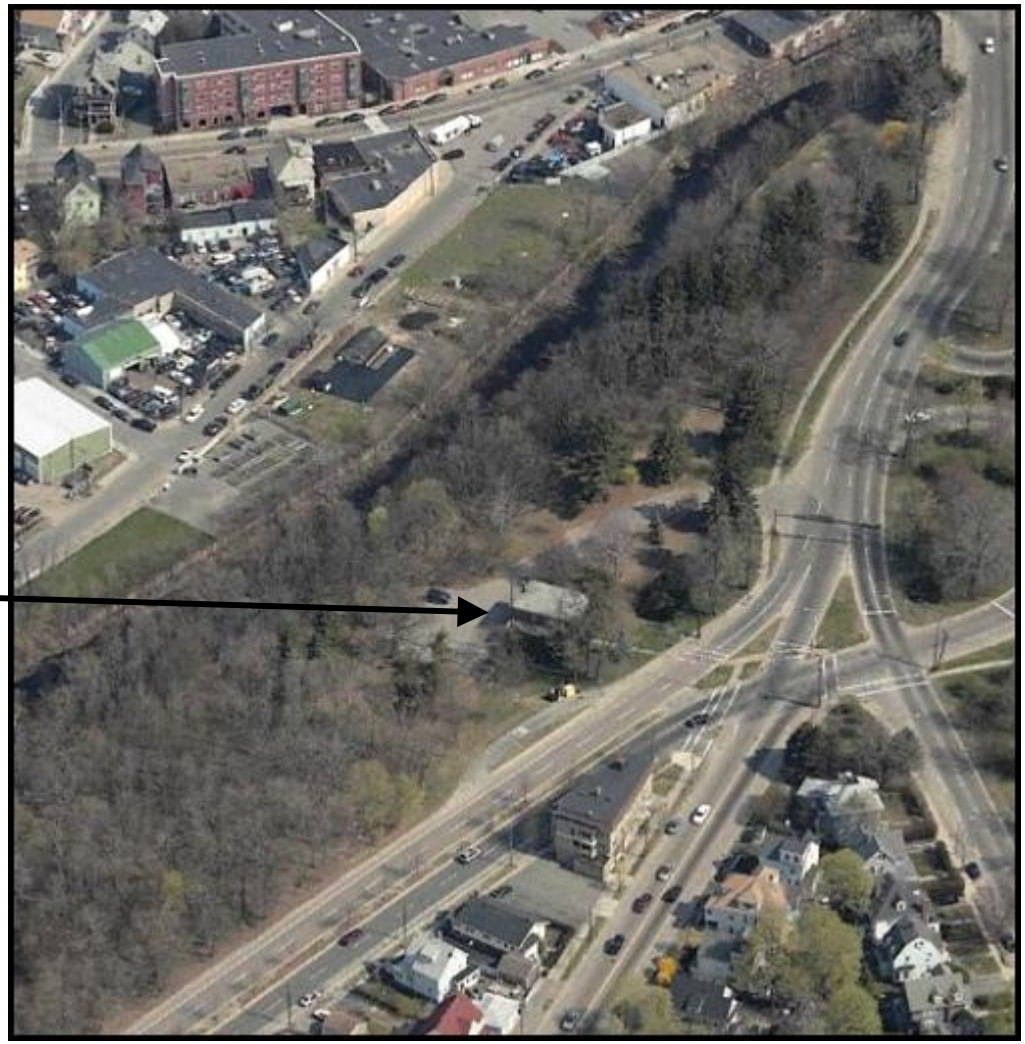
PCB Sampling Results

- With respect to PCBs, soils are safe for recreational use
- No soil cleanup necessary for PCBs
- No restrictions necessary

Metals Sampling Results

- With respect to metals, soil at all areas except Area 1962-E are safe for recreational use and even for residential use.
- No cleanup necessary, except for lead at one location at Area 1962-E
  - Lead at one sampling location in Area 1962-E will be removed

Dredge Spoil Area 1962-E
DCR Building



Summary of Results and Conclusions

- Soil and sediment sampling shows that all areas except Area 1962-E are safe for recreational use and no cleanup is necessary
- One soil sampling location at Area 1962-E requires further sampling and limited soil removal due to lead concentrations
  - Soil sampling and removal is planned
- Confirmatory testing for metals is planned at three locations in Area 1962-I
- Due diligence sampling confirms historical dredging does not impact public safety in these areas

Next Steps

- Area 1962-E
  - More sampling and metals analysis to bound impact at one location
  - Remove impacted soil (less than 20 cubic yards)
- Area 1962-I
  - More sampling and metals analysis to further investigate 3 separate locations
  - Evaluate results to confirm that standards are met and no cleanup is necessary
- Complete further investigation of the Braided Channel
- Continue to prepare for sampling and analysis of privately owned properties
- MassDEP and DCR will continue public communication of results and plans as they develop

MassDEP Weblink and Future Actions

- A Mass DEP Weblink established for public access to the information about this investigation and its findings

  www.mass.gov/dep/cleanup/sites/neponset.htm
- This presentation will be posted on the weblink
- Copies will be placed in public repositories (Hyde Park Library, Mattapan Branch Library, and East Milton Library).
- Details of future activities will be provided thru public meetings and on the Weblink.
- Final project completion report will be provided in the same manner.

QUESTIONS & COMMENTS

Contact:
Christopher Pyott
MassDEP Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887
(978) 694-3353
Christopher.Pyott@state.ma.us